UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,791	09/19/2005	Tomomi Katoh	2271/75134	7893

23432 7590 04/07/2008

COOPER & DUNHAM, LLP
1185 AVENUE OF THE AMERICAS
NEW YORK, NY 10036

EXAMINER	
LEBRON, JANNELLE M	

ART UNIT	PAPER NUMBER
2861	

MAIL DATE	DELIVERY MODE
04/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,791	KATOH, TOMOMI	
	Examiner	Art Unit	
	JANNELLE M. LEBRON	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *03 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kusunoki et al. (WO 03/026897).

3. Regarding claims 1-10, Kusunoki et al. discloses an image reproducing and forming apparatus

- Claim 1:

comprising:

an ejection head configured to eject a liquid droplet from a nozzle to form an image on a medium;

a driving signal generating unit (circuit 77; page 24, line 16 through page 25, line 3) configured to generate a driving signal having a waveform (as seen in figs. 13 and 14) that includes an ejecting pulse for causing the liquid droplet to be ejected from the nozzle and another pulse (as seen in fig. 15), and to select a desired waveform from the driving waveform to produce a driving signal, the driving signal generating unit being further configured to produce a non-ejecting pulse (as seen in fig. 16; page 37, lines 8-16) making use of different portions of the driving waveform (uses a different portion of

the driving waveform in figs. 15 and 17), the non-ejecting pulse having a pulse width greater than that of the ejecting pulse (this limitation is not found in the disclosure and thus is not taken into consideration for purposes of examination; in addition, please note that the importance of the non-ejecting pulse being kept small is pointed out, at least, in paragraphs 0015, 0081, 0088 and 0099) while producing energy for not ejecting the droplet; and

a driving unit (head driving unit 71) configured to drive the ejection head based on the driving signal supplied from the driving signal generating unit (page 24, line 16 through page 25, line 3).

- Claim 2:

comprising:

an ejection head configured to eject a liquid droplet from a nozzle to form an image on a medium;

a driving signal generating unit (circuit 77; page 24, line 16 through page 25, line 3) configured to generate a driving signal having a waveform (as seen in figs. 13 and 14) that includes an ejecting pulse for causing the liquid droplet to be ejected from the nozzle and another pulse (as seen in fig. 15), and to select a desired waveform from the driving waveform to produce a driving signal, the driving signal generating unit being further configured to produce a non-ejecting pulse (as seen in fig. 16; page 37, lines 8-16) making use of different portions of the driving waveform (uses a different portion of the driving waveform in figs. 15 and 17), the non-ejecting pulse producing energy for not ejecting the droplet; and

a driving unit (head driving unit 71) configured to drive the ejection head based on the driving signal supplied from the driving signal generating unit (page 24, line 16 through page 25, line 3),

wherein a driving waveform includes first and second dummy pulses and a driving signal generating unit produces a non-ejecting pulse making use of a portion of the first dummy pulse and a portion of the second dummy pulse (the non-ejecting pulse includes two portions; as seen in fig. 10, page 27, line 19 through page 28, line 13).

- Claim 3:

comprising:

an ejection head configured to eject a liquid droplet from a nozzle to form an image on a medium;

a driving signal generating unit (circuit 77; page 24, line 16 through page 25, line 3) configured to generate a driving signal having a waveform (as seen in figs. 13 and 14) that includes an ejecting pulse for causing the liquid droplet to be ejected from the nozzle and another pulse (as seen in fig. 15), and to select a desired waveform from the driving waveform to produce a driving signal, the driving signal generating unit being further configured to produce a non-ejecting pulse (as seen in fig. 16; page 37, lines 8-16) making use of different portions of the driving waveform (uses a different portion of the driving waveform in figs. 15 and 17), the non-ejecting pulse producing energy for not ejecting the droplet; and

a driving unit (head driving unit 71) configured to drive the ejection head based on the driving signal supplied from the driving signal generating unit (page 24, line 16 through page 25, line 3),

wherein the driving waveform includes a dummy pulse [non-ejection pulse] and the driving signal generating unit produces the non-ejecting pulse, making use of a portion of the dummy pulse and a portion of the ejecting pulse; page 27, line 19 through page 28, line 13).

- Claim 4:

wherein the driving signal generating unit produces the non-ejecting pulse that draws in a meniscus of the nozzle (page 28, lines 5-8).

- Claim 5:

wherein the driving signal generating unit produces the non-ejecting pulse that pushes out a meniscus of the nozzle and has a pulse width smaller than a period of pressure-induced resonance in a liquid chamber of the ejection head (so that the droplet is not ejected).

- Claim 6:

wherein the non-ejecting pulse has a falling edge with a first rate of voltage change and a rising edge with a second rate of voltage change that is smaller than the first rate of voltage change (page 39, line 25 through page 41, line 2).

- Claim 7:

wherein the non-ejecting pulse includes a first portion that draws in a meniscus of the nozzle with a first rate of voltage change and a second portion that restores the meniscus of the nozzle with a second rate of voltage change smaller than the first rate of voltage change (as seen in fig. 10; page 27, line 19 through page 28, line 13).

- Claim 8:

wherein the non-ejecting pulse includes a first waveform that pushes out a meniscus of the nozzle and a second waveform that follows the first waveform to draw in the meniscus of the nozzle, the first waveform having a pulse width smaller than a resonant frequency of a liquid chamber of the ejection head (page 34, lines 1-9).

- Claim 9:

wherein the driving signal includes a first non-ejecting signal inserted at a beginning of the driving signal (holding signal b; page 28, line 2 through page 29, line 23) and a second non-ejecting signal inserted at an end of the driving signal (as seen in fig. 15a).

- Claim 10:

wherein the ejection head includes an actuator (piezoelectric vibrator 52) for producing a pressure to eject the droplet, and the driving signal including the non-ejecting pulse is applied to the actuator (page 22, lines 6-19).

4. Regarding claims 11-17, Kusunoki et al. discloses all the limitations in these claims as set forth above regarding claims 4-10 and thus the rejection does not need to be repeated.

Response to Arguments

5. Applicant's arguments filed 03/03/2008 fully considered but they are not persuasive.

6. Regarding applicant's argument that Kusunoki simply "does not disclose or suggest an image reproducing and forming apparatus as recited in independent claim 1

of the present application, wherein the non-ejecting pulse has a pulse width greater than that of the ejecting pulse, while producing energy for not ejecting the droplet", please note that the examiner maintains that such limitation is not found in the disclosure and thus is not taken into consideration for purposes of examination. Paragraph 0116 merely discloses how "concerning the initial print quality, satisfactory print image quality is obtained with a long pulse width" and does not mention a non-ejecting pulse and mush less it being greater than that of the ejecting pulse.

7. In addition, please note that the importance of the non-ejecting pulse being kept small is pointed out, at least, in paragraphs 0015, 0081, 0088 and 0099. Regarding applicant's argument that Figures 9B through 9E show the missing feature, please note that the drawing or its explanation are not sufficient to draw the conclusion that the pulse width of the non-ejecting [dummy] pulse is greater than that of the ejecting pulse. Actually, the description on the drawing 9E [for the non-ejecting pulse] in paragraph 0081 it is indicated that "in view of the purpose of driving the inkjet head at a frequency other than the natural frequency, it is effective to set the non-ejecting voltage Vd large and to set the slopes of the falling edge and the rising edge gentle. *However, if the slope is set gentle, the pulse width of the dummy signal becomes large, and the driving period becomes long. This results in a decreased printing rate, and therefore, it is not desired to set the pulse slope gentle more than is needed* [emphasis added]" which seems to contradict the applicant's arguments.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JANNELLE M. LEBRON whose telephone number is (571)272-2729. The examiner can normally be reached on Monday thru Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jannelle M. Lebron/
Examiner, Art Unit 2861

/LUU MATTHEW/
Supervisory Patent Examiner, Art Unit 2861